SECTION 16196
ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.2 SUMMARY

A. This Section includes:
   1. Nameplates.
   2. Tape labels.
   3. Wire and cable markers.
   4. Conduit markers.

1.3 SUBMITTALS

A. Products furnished from listed manufacturers are pre-approved but still require submittal.

B. Submit proposed substitutions for approval in accordance with General and Supplementary Conditions.

C. Submit nameplate schedules showing all proposed engraving for approval prior to engraving. The Construction Manager reserves the right to change label names at any time prior to engraving.

1.4 SYSTEM IDENTIFICATION

A. Identify electrical equipment at the Oak Ridge Site according to the one-line diagram.
   1. For the Oak Ridge Site, include the following:
      a. switch identification,
      b. location of line side disconnect, (FED FROM FE-SG-SS1-2)
      c. voltage and number of phases,
      d. equipment served,
      e. equipment number, and
      f. equipment location.

B. Identify safety switches, enclosed circuit breakers, motor starters, lighting panels, power panelboards, and other similar electrical equipment. ¾-inch to 1-inch white plastic adhesive tape having approximately ½-inch-tall (minimum) black letters.

C. Identify light switches, receptacles, and other similar electrical devices with 1/2-in. white plastic adhesive tape having approximately 5/32-in.-tall letters.

D. Example: A lighting switch on Circuit 15 from Panel FE-1PP5 would be marked "120 V, 1 Ø, Circuit 15, FE-1PP5."

E. Panelboard Directories: Indicate for each circuit the equipment served, floor and column location, and room number. Identify spare circuits.

F. Identify conduit at the Oak Ridge Site using equipment identification scheme in Paragraph “1.4A” above to identify conduits.

1. For the Oak Ridge Site, include the following:
   a. Conduits containing 480-V switchgear branch circuits. Identify conduits, which contain 480-V circuits supplying equipment not having a local disconnect or controller, at the equipment being served.
   b. Conduits containing circuits higher than 480 V.
   c. Underground conduits.
2. Identify conduits at switchgear, entry and exit points of junction and pull boxes, on both sides of walls or floors which conduit penetrate, and at equipment in which conduits terminate.
3. Identify underground conduit at both ends.
4. Identify underground conduit not encased in concrete and direct buried cable by installing a 6-inch-wide red marker tape (with continuous warning message in black letters imprinted on the tape) 6 to 12-inches below grade for the length of the conduit or cable.
   a. Trenches 18-inches Wide or Less: use a single tape located in the center of trench.
   b. Trenches Wider than 18-inches: Use two tapes parallel to each other as close to the sides of the trench as possible.
   c. If cables or conduits are installed less than 18-inches below grade, make tape elevation one-half the distance between the cable or conduit and grade.

G. Identify single-conductor power and control wiring originating from switchgear or MCCs.
1. Identify conductors in junction or pull boxes containing taps or splices and at terminations.
2. Identify three-phase power feeder conductors by phase designations (e.g., PH-A, PH-B, and PH-C) or by color code specified per Section 16120, Paragraph 2.1.G, “Color Coding.”
3. Identify conductors with cloth markers or split sleeve or tubing-type markers.
4. Cable labeling shall show cable number and source and destination points of cable.

H. Identify branch circuit conductors originating from panelboards.
1. Identify conductors with vinyl, wrap-around, self-laminating, printable wire markers utilizing alphanumeric characters of 1/8 to 3/16 in. height, printed with black ink on white background.
2. Place markers within 1in. of where insulation has been removed for junctions or terminations.
3. In addition to indicating the panelboard number and branch circuit number, identify conductors as follows:

a.	120-V, single-phase, two wire system	120V-1PH
b.	240/120-V, single-phase, three-wire systems	240/120V-1PH-A 240/120V-1PH-B
c.	208Y/120-V, three-phase, four-wire systems	208Y/120V-3PH-A 208Y/120V-3PH-B 208Y/120V-3PH-C
d.	240-V, Delta, three-phase, three-wire systems	240VD-3PH-A 240VD-3PH-B 240VD-3PH-C
e.	480Y/277V, three-phase, three-wire or four-wire systems	480Y/277V-3PH-A 480Y/277V-3PH-B 480Y/277V-3PH-C
f.	480-V, Delta, three-phase, three-wire systems	480VD-3PH-A 480VD-3PH-B 480VD-3PH-C

I. Identify multiconductor cables installed in raceways at each termination with flag-type plastic ties. Cable labeling shall show cable number.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Nameplates: Engraved three-layer laminated plastic, white letters on black background.

B. Tape Labels:
1. ¾-inch to 1-inch plastic tape with permanent pressure sensitive adhesive, black letters on white background, adjustable font size (1/2-inch-tall minimum). Use outdoor rated tape for outdoor installations.
2. 1/2-inch plastic tape with permanent pressure sensitive adhesive, black letters on white background, adjustable font size (5/32-inch-tall minimum). Use outdoor rated tape for outdoor installations.

C. Wire and Cable Markers:
1. Cloth Markers: W. H. Brady Company, "QUICK LABEL."
2. Split Sleeve or Tubing Type: 3M Company, "SCOTCH CODE."
3. Vinyl, Self-Laminating, Printable Markers: Thomas & Betts, Type WSL.
4. Multiconductor Cable Markers: "PANDUIT" flag-type plastic ties.

D. Conduit Markers: Aluminum or plastic tags with raised letters attached to conduit with sunlight resistant "TYRAPS."

E. Underground Conduit and Direct Buried Cable Markers: 6-in.-wide red polyethylene tape, minimum thickness of 3.5 mil, with continuous warning message in black letters imprinted on tape; Thomas & Betts NA-0600, Panduit HTU6R-E, or W.H. Brady Company 91296.

PART 3 - EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive nameplates, tape labels, and cable markers.

3.2 INSTALLATION

A. Install nameplates and tape labels parallel to equipment lines.

B. Install tape labels to equipment front cover plates.

C. Secure nameplates to equipment fronts using screws. Rivets are not acceptable.

D. Secure nameplate to inside face of recessed troffers using adhesive.

E. After applying tape label on equipment or device, brush a coat of clear lacquer over the tape label prior to field painting.

F. Mask tape label during field painting with masking tape to prevent painting tape label.

G. Using a typewriter or other mechanized means, fill out panelboard directories and place directories in directory card holder.

H. Install conduit markers.

I. Install wire and cable markers.

END OF SECTION 16196